



Figure 2

1 ctgcagtgaa taataaaatg tgtgtttgtc cgaataacgc gttttgagat tctgtcgcc  
61 gactaaatc atgtcgcgcg atagtgggtt ttatcgccga tagagatggc gatattggaa  
121 aaatcgatat ttgaaaatat ggcataattga aaatgtcgcc gatgtgagtt tctgtgtaac  
181 tgatatacgcc atttttccaa aagtgtattt tgggcatacg cgaatctcg cgatacggct  
241 tatatacgttt acgggggatg gcgataagac actttggcga cttggcgat tctgtgtgtc  
301 gcaaatatcg cagtttcgat ataggtgaca gacgatata ggctataatc cggataaggg  
361 cgacatcaag ctggcacatg gccaatgcat atcgatctat acattgaatc aatattggca  
421 attagccata ttatgcattg gttatatagc ataaatcaat attggctatt ggccattgca  
481 tacgttgat ctatatcata atagtacat ttatattggc tcatgtccaa tatgacggc  
541 atgttgacat tgattattga ctagttatta atagtaatca attacgggtt cattagtcca  
601 tagcccatat atggagttcc gcgttacata acttacggta aatggccgc ctcgtgaccg  
661 cccaacgacc cccgccatt gacgtcaata atgacgtatg ttcccatag aacgccaata  
721 gggactttcc attgacgtca atgggtggag tatttacggt aaactgccca cttggcagta  
781 catcaagtgt atcatatgcc aagtcggccc ccctattgac gtcaatgacg gtaaatggcc  
841 cgctggcat tatgccagc acatgacctt acgggacttt cctactggc agtatcatca  
901 cgtattatgc atgcctatta ccatgggtgat gcggtttgg cagtacacca atggcggtg  
961 atagcggtt gactcacggg gatttccaag tctccacccc attgacgtca atgggagtt  
1021 gttttggcac caaaatcaac gggactttcc aaaatgtcgt aataaccccg cccggtgac  
1081 g<sup>caaat</sup>gggc ggtaggcgtg tacggtggga ggtcta<sup>tata</sup>gacagagctc gtttagtgaa  
1141 cgg<sup>+</sup>agatc gctggagac gccatccagc ctgttttgac ctccatagaa gacaccggga  
1201 ccatccagc ctcgcggcc gggaaacggtg cattggaacg cggattcccc gtgccaagag  
1261 tgacgTAAAGT ACCGCCTATA GACTCTATAG GCACACCCT TTGGCTCTTA TGCATGCTAT  
1321 ACTGTTTTTG GCTTGGGGCC TATACACCC CGCTCCTAT GCTATAGGTG ATGCTATAGC  
1381 TTGCCTATA GGTGTGGGT ATTGACCATT ATTGACCACT CCCCTATTGG TGACGATACT  
1441 TTCCATTACT AATCCATAAC ATGGCTCTTT GCCACAACTA TCTCTATTGG CTATATGCCA  
1501 ATACTCTGTC CTTGAGAGAC TGACACGGAC TCTGTATTTT TACAGGATGG GGTCCCATTT  
1561 ATTATTACAA AATTCACATA TACAACAACG CCGTCCCCCG TGCCCGCAGT TTTTATTA  
1621 CATAGCGTGG GATCTCCACG CGAATCTCGG GTACGTGTC CGGACATGGG CTCTTCTCG  
1681 GTAGCGCGCG AGCTTCCACA TCCGAGCCCT GGTCCCATGC CTCAGCGCG TCATGGTCG  
1741 TCGGCGCTC CTTGCTCCTA ACAGTGGAGG CCAGACTTAG GCACAGCACA ATGCCACCA  
1801 CCACCAAGTG GCCGCACAAG GCGTGGCGG TAGGGTATGT GTCTGAAAAT GAGCTCGGAG  
1861 ATTGGGCTCG CACCGTGACG CAGATGGAAG ACTTAAGGCA GCGGCAGAAG AAGATGCAGG  
1921 CAGCTGAGTT GTTGATTCT GATGAGATC AGAGGTAAT CCCGTTGCGG TGCTGTTAAC  
1981 GGTGGAGGCG AGTGATGCT GAGCAGTACT CGTTGCTGCC GCGCGGCCA CCAGACATAA  
2041 TAGCTGACAG ACTAACAGAC TGTTCTTTTC CATGGGTCTT TTCTGCAGtc accgtcctg  
2101 acacgatgga gtcctctgcc aagagaaa<sup>a</sup>tgaccctga taatcctgac gagggccctt  
2161 cctccaaggt

Enhancer Region  
(-600 - -1081)

Pol II Promoter  
(1081 - 1143)

Exon 1 (5' UTR)  
(1144 - 1264)

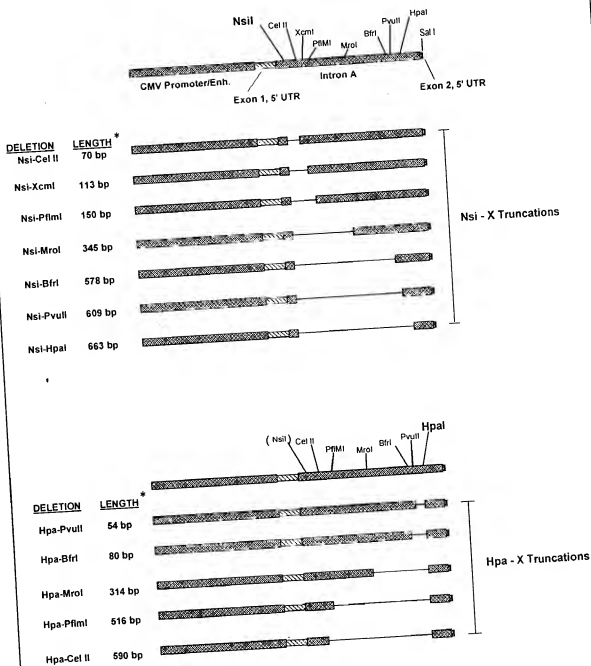
Intron A  
(1265 - 2088)

Exon 2 (5' UTR,  
Start of Trl.)  
(2089 - )

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Figure 3

# Deletions Made Within Intron A of CMV IE1



\* Following restriction enzyme digestion, blunting, religation

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Figure 4

Intron A Internal Deletion Mutants  
(Transiently-Transfected 293 cells)

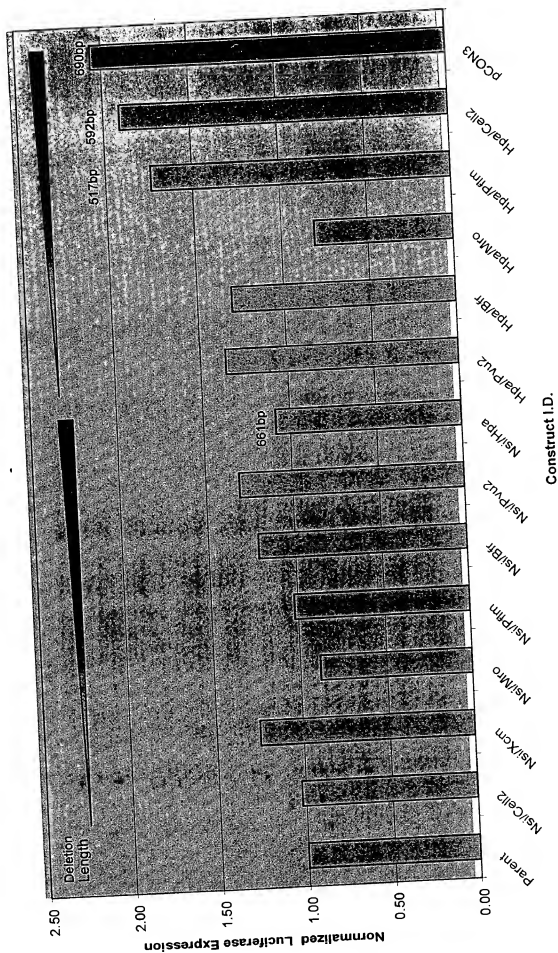


Figure 5A

1. Wild Type Rabbit  $\beta$ -Globin Sequence

GTGGTATCCTTTTACAGCACAACTTAATGAGACAGATAGAACTGGTCTTGAGAAACA

Splice Donor

GAGTAGTCGCCTGCTTTTCTGCCAGGTGCTGACTTCTCTCCCCTGGGCTGTTTTCAATTTCTCAG

Branch Pt.

Polypyrimidine Tract

Figure 5B

2. Optimized Rabbit  $\beta$ -Globin Sequence

GTAAGTATCCTTTTACAGCACAACTTAATGAGACAGATAGAACTGGTCTTGAGAAACA

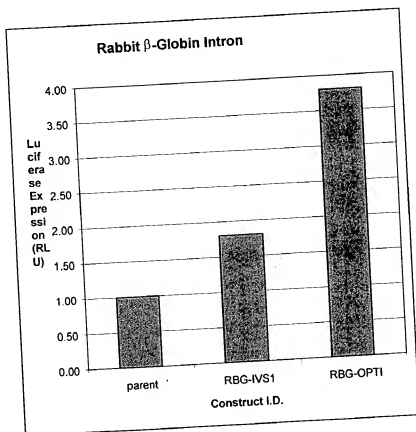
Splice Donor

GAGTAGTCGCCTGCTTTTCTGCCAGGTACTAACTTCTCTCCCCTGCTCTTTTCTTTTCTGCAG

Branch Pt.

Polypyrimidine Tract

Figure 6



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**FIGURE 7**

**In Vivo Immunogenicity of Plasmid Vectors  
Containing Modified Introns**

